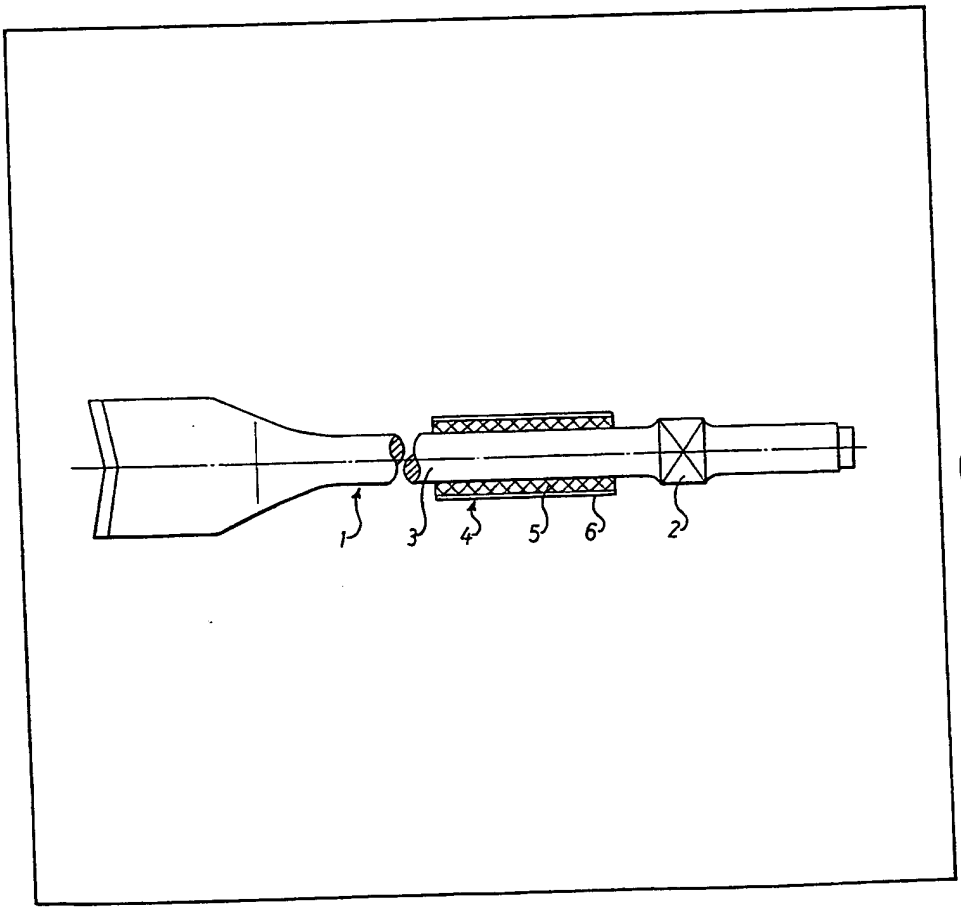
(12) UK Patent Application (19) GB (11) 2 035 184 A

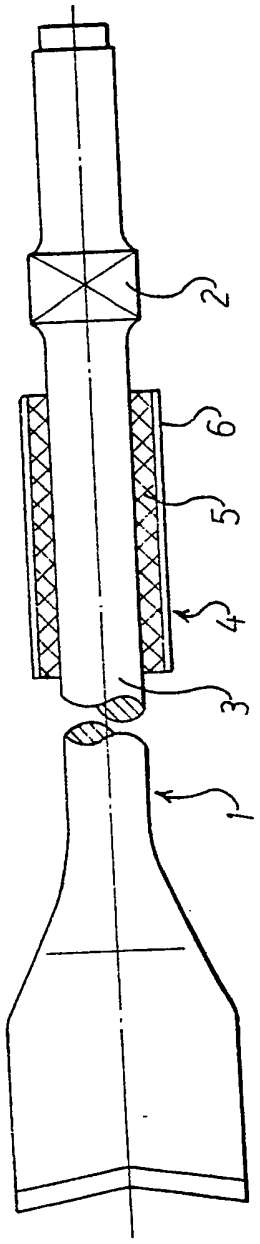
(21) Application No 7940597
(22) Date of filing 23 Nov 1979
(30) Priority data
(31) 2851160
(32) 25 Nov 1978
(33) Fed Rep of Germany (DE)
(43) Application published
18 Jun 1980
(51) INT CL³
B25D 17/02 17/11
(52) Domestic classification
B4C 11A 6H 6X
(56) Documents cited
GB 1413720
GB 1367387
GB 1291781
GB 1282050
GB 552305
GB 332914
(58) Field of search
B4C
(71) Applicants
Wacker Werke GMBH & Co. KG,
Preussenstrasse 41, 8000 Munchen 40, Federal Republic of Germany
(72) Inventor
Franz Beierlein
(74) Agents
W. P. Thompson & Co.

(54) A tool sound damping device

(57) A tool (1) for a hammer drill or break up hammer has a sound damping device (4). The device comprises a resilient body (5) and a rigid tubular casing (6) of tubular cross-section. The body is in direct contact with the shank (3) of the tool and has adhesive properties which fixedly attach the body member (5) to the material of the tool shank (3) and the material of the casing (6). Preferably a flowable polyurethane is introduced into the space between the shank (3) and the casing (6) and cured in situ.



GB 2 035 184 A



SPECIFICATION

A tool sound damping device

This invention concerns a sound damping device for percussion tools and has particular application to tools for hammer drills and break-up hammers.

A known tool for percussion hammers has a device for reducing the generation of sound, which device comprises a body which surrounds a shank of the tool and which is made from a resilient material suitable for damping out the lateral vibrations of the tool. The damping body has a surrounding protective casing which serves to fasten the damping body and to secure it against axial displacement on the tool shank. For this purpose, the protective casing is arranged around the damping body, and subsequently deformed, after mounting the damping body which previously has to be manufactured in the form of a moulded body of the correct shape to fit the tool shank. This manner of mounting the device on the tool is labour-intensive and is also usually troublesome. Means for axially securing the device, such as circumferential grooves, or portions having a reduced diameter or the like are also frequently provided on the tool itself in the region of the shank and these reduce the cross section and weaken the tool. These means form steps on the shank for the secured device, and parts of the device come into abutment thereagainst. In a known device, the part thereof which comes into abutment against the means provided on the shank is, for example, the drawn-in edge of the protective sleeve which engages a circumferential groove in the shank.

An object of the invention is to provide a sound damping device for power tools which is simpler to construct and assemble than higherto and which, in particular, can be mounted on the tool shank without deformation of the protective sheath and which also does not require any special configuration of the tool shank in order to secure the device against axial displacement when working with the tool.

In accordance with the present invention there is provided a tool for hammer drills and break-up hammers the tool having a sound damping device comprising a body fixedly mounted on and in direct contact with a shank of the tool and made from a resilient material suitable for damping the lateral vibrations of the tool, a rigid tubular sheath surrounding the body to proect the said body from damage during use of the tool, the sheath having a substantially uniform cross section over its length and having an internal dimension corresponding to at least the external dimension of a tool collar located, in use, at that end of the tool shank which faces the hammer, the material of the damping body being a solidifiable material which is flowable before solidification and which retains adhesive properties after solidification with respect to the material of the tool and the material of the casing.

The invention will be further described hereafter by way of example only with reference to one embodiment illustrated in the drawing. The single Figure of the drawing is a side elevation of a hammer tool, a tamping tool in the present instance, with a device in accordance with the invention mounted thereon, the device being shown in section.

An end of the tamping tool 1 facing a hammer (not shown) has a conventional collar 2 which is normally circular and which limits the depth to which the tool is inserted into the hammer. A device generally indicated as 4 for reducing the generation of sound is secured to a tool shank 3 at a distance from the tool collar 2, such that the device cannot be axially displaced even under the high stresses acting upon the tool when performing work. The device comprises a damping body 5 which abuts rigidly against the shank, and a protective sheath or casing 6 which surrounds the damping body 5 and protects the latter against damage when striking against hard objects. The sheath 6 is in turn connected to the damping body so as to be axially non-displaceable relative to the outer surface of the damping body.

In the illustrated embodiment, the casing 6 is a thin wall tubular member of circular cross section whose internal diameter is somewhat larger than the external diameter of the collar 2, so that it can be readily pushed across the collar 2 to the location at which the device is secured. In accordance with the invention, the damping body 5 is mounted on the shank 3 so as to produce, at the same time, an intimate, permanent contact between the body 5 and the shank 3 on the one hand, and, on the other hand, between the body 5 and the casing 6. This is achieved in a particularly simple manner by choosing for the damping body a material which is flowable before solidification and which retains adhesive properties after solidification with respect to the steel of the tool and the material of the casing, such as a plastics material system or a vulcanizable material which, at the intended fastening location, is simply introduced in a flowable state into the space between the tool shank 3 and the casing 6 which is held at a uniform distance from the tool shank by means of a suitable holder, the flowable material solidifying only after it has been introduced into the said space. Owing to the fact that the adhesive property of the material of the damping body is retained with respect to the material of the tool and the material of the casing after solidification, such as hardening in the case of a plastics material system, the axial undisplaceability of the device 4 on the shank 3 is permanently ensured after solidification.

The device primarily damps lateral vibration of the shank which occur during operation of the tool and which play a substantial part in the development of sound.

A two-component polyurethane system is particularly suitable as the plastics material system for the damping body. After mixing the two components, this compound sets after approximately 30 minutes and then hardens in 24 hours.

Practical tests have shown that the fatigue strength of devices in accordance with the invention is very satisfactory. When required, a further increase in the fatigue strength can be obtained by applying a commercially available adhesion agent to the interior surface of the casing and to the tool shank before introducing the material forming the damping body.

CLAIMS

1. A tool for hammer drills and break-up hammers the tool having a sound damping device comprising a body fixedly mounted on and in direct contact with a shank of the tool and made from a resilient material suitable for damping the lateral vibrations of the tool, a rigid tubular sheath surrounding the body to protect the said body from damage during use of the tool, the sheath having a substantially uniform cross section over its length and having an internal dimension corresponding to at least the external dimension of a tool collar located, in use, at that end of the tool shank which faces the hammer, the material of the damping body being a solidifiable material which is flowable before solidification and which retains adhesive properties after solidification with respect to the material of the tool and the material of the casing.

2. A tool as claimed in claim 1, in which the material of the damping body is vulcanizable.

3. A tool as claimed in claim 1, in which the material of the damping body comprises a plastics material system.

4. A tool as claimed in claim 3, in which the material of the damping body is a two-component polyurethane system.

5. A tool as claimed in any one of the preceding claims in which the cross section of the tubular sheath is circular.

6. A tool as claimed in any one of the preceding claims, in which a commercial available adhesion agent is applied to the tool shank and to the interior surface of the sheath in the region of the damping body.

7. A tool constructed and arranged substantially as hereinbefore described with reference to and as illustrated in the accompanying drawing.

Printed for Her Majesty's Stationery Office by The Tweeddale Press Ltd., Berwick-upon-Tweed, 1980.
Published at the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.